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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-wide BA2 Applied Research					R-1 ITEM NOMENCLATURE Next Generation Internet PE 0602110E , R-1 #9					
<i>COST (In Millions)</i>	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Cost To Complete	Total Cost
Total Program Element (PE) Cost	35.425	14.862	0.000	0.000	0.000	0.000	0.000	0.000	0.000	N/A
Next Generation Internet NGI-01	35.425	14.862	0.000	0.000	0.000	0.000	0.000	0.000	0.000	N/A

(U) Mission Description:

(U) The Next Generation Internet (NGI) initiative has three goals: (1) promote experimentation with the next generation of networking technologies; (2) connect universities and national laboratories with high speed networks that are 100 - 1000 times faster than today's Internet; and (3) demonstrate revolutionary applications that meet important national goals and missions. The principal agencies involved in this initiative are DARPA, NSF, NIST, NIH and NASA. These agencies are sharing in funding this research and development effort. The DARPA activity will be aimed at part of the first two goals. DARPA will demonstrate end-to-end network connectivity at 1+ gigabits-per-second for 10 or more NGI sites. The network technologies to be addressed include multi-gigabit broadband networks, guaranteed quality of service mechanisms, and integrated network management. These technologies will be demonstrated in NGI developed testbed environments for defense-specific applications. Robustness of applications built atop diverse logical and physical infrastructure will be ensured with the development of new software and hardware tools that can automatically track and assess the inter-dependencies of physical layer resources. This project ends in fiscal year 2001.

(U) Program Accomplishments and Plans:

(U) FY 2000 Accomplishments:

- Gigabit-per-second Network Connectivity. (\$ 17.000 Million)
 - Implemented variable rate access technologies and prototype of distributed optical switching capability compatible with 100 Gb/s optical network.
 - Implemented streamlined Internet over wavelength division multiplexed (WDM) protocol structure, eliminating two layers of existing telecommunications infrastructure.
- Network Management. (\$ 18.425 Million)
 - Developed network planning and simulation technology to meet requirements for NGI scale networks.

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- Demonstrated real-time (500-msec response) monitoring and control of network resources at all levels.
- Completed interconnection of Supernet testbed components and software with 2.5 gigabit-per-second access architecture, up to 10 gigabit-per-second backbone, and 100 Gb/s distributed switching capacity.
- Demonstrated information management and collaborative applications operating over NGI testbed.

(U) FY 2001 Plans:

- Network Architecture and Management for Robust Heterogeneous Gigabit Networks. (\$ 6.795 Million)
 - Complete development architectural framework for ensuring maximum end-to-end system survivability.
 - Demonstrate prototype tool for assessing dependence of applications or networking performance on physical layer resources.
 - Specify robust heterogeneous network architecture that integrates gigabit wireless, wireline and satellite communications.
- Defense Applications of Gigabit Networks. (\$ 8.067 Million)
 - Finish development of a virtual radar console tied to a physical radar and remotely accessible via wide-area network.
 - Demonstrate real-time, high-resolution imagery transfer over multiple streams of multi-gigabyte flows.
 - Enable streaming of raw (undigitized) sensor signal over wide-area links.

(U) FY 2002 Plans:

- Not Applicable.

(U) <u>Program Change Summary:</u> (In Millions)	<u>FY2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
Previous President's Budget	36.473	15.000	0.000
Current Budget	35.425	14.862	0.000

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(U) **Change Summary Explanation:**

FY 2000 Decrease reflects minor repricing and SBIR reprogramming.
FY 2001 Decrease reflects the Section 8086 reduction, the government-wide rescission and minor repricing.

(U) **Other Program Funding Summary Cost:**

- Not Applicable.

(U) **Schedule Profile:**

- Not Applicable.